

**OBSERVATIONS ON THE BEHAVIOUR OF THE PANOPTES
BLUE BUTTERFLY, *PSEUDOPHILOTES PANOPTES* (HÜBNER)
(LEP.: LYCAENIDAE)**

R.J. MORRIS

Christ's College, Cambridge CB2 2BU.

CONTINUOUS OBSERVATIONS on the behaviour of an individual Panoptes Blue butterfly, *Pseudophilotes panoptes*, were noted over a period of four hours, to see if this species showed thermoregulatory behaviour characteristic of small butterflies as described by Heinrich (1993). The time spent in various thermoregulatory activities was recorded, along with details of territorial and feeding behaviour. The fieldwork was carried out in March 1994 on a disturbed habitat near Malaga, in southern Spain.

Butterflies need to elevate their thoracic temperature in order to fly. They do this by basking. Basking posture varies with family and in the Lycaenidae lateral basking, in which the wings are closed dorsally and tilted sideways to present the underside of the wings at right angles to the sun, is common. Blues of the genus *Everes* and *Glaucopsyche* bask with wings partially open to the sun (Heinrich 1993). It has been suggested that in this posture the wings act as reflectance panels that focus heat onto the body (Kingsolver 1985a,b), but Heinrich (1990) has shown that the wings in fact act as convection baffles to retard cooling. Small-bodied butterflies have only a limited flight range of a few seconds because they cool rapidly by convection. The range per flight is temperature dependent; individuals bask for longer and make shorter flights at low ambient temperatures (T_a) (Heinrich 1993).

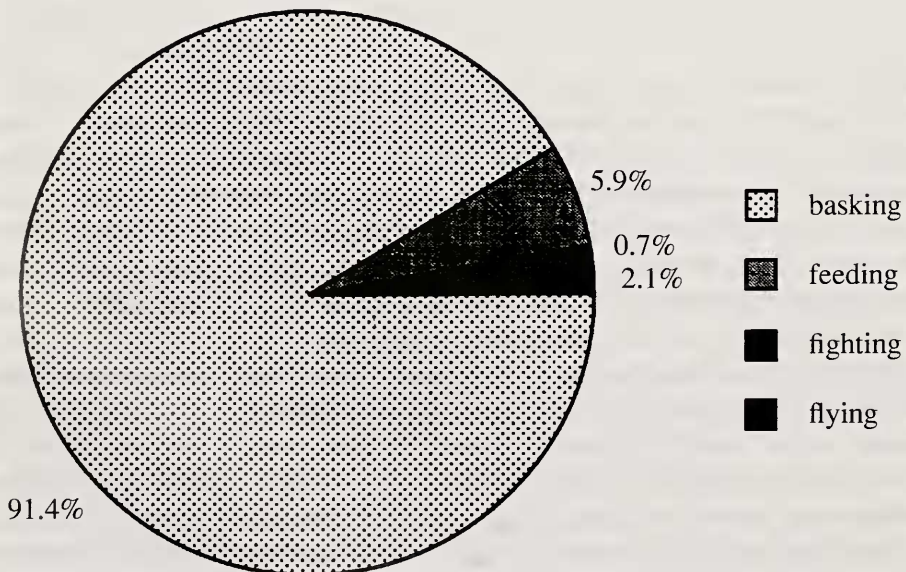
The Panoptes Blue spent 91.4% of its time basking on low plants about 5cm above the ground, more frequently with fully opened wings, than with partially opened wings (Figure 1). The butterfly orientated itself with its thorax facing the sun, maximising the interception of solar radiation. Often a complete circle was turned after landing before the most favourable position was found. Some lateral basking behaviour was also observed. When the sun temporarily disappeared behind clouds, or there was a sudden gust of wind, the wings of the Panoptes Blue were closed to a greater degree which may have further decreased convective cooling. In strong gusts of wind the wings were completely closed, with the forewings drawn up between the hindwings, thus decreasing the surface area exposed and perhaps minimising heat loss. This posture may also have made the butterfly less susceptible to being blown away. Complete closure of the wings also occurred in extremely hot conditions and this may have prevented overheating. Taking to flight may achieve the same result by causing heat loss (dependent on T_a).

The Panoptes Blue is a small butterfly and flies in a fluttering manner for only a short period of time (2.1% of total time observed) (Figure 1) before landing to bask.

Aggressive behaviour was observed in the Panoptes Blue (0.7% of total time observed) (Figure 1). The individual studied remained in the same area (approximately 1m²) of open ground for the duration of the four hour period. That area can be called a territory for the purpose of this study. When a second butterfly of the same species entered that territory a particular sequence of behaviour was observed. First the two butterflies flew straight upwards together in close proximity, appearing to be in physical contact at times. Then they separated before spiralling downwards and flying upwards together again. Each of these interactions lasted several seconds and was followed by a brief rest period of basking before the sequence started again. The intruder was eventually chased away every time; in one case it had to be chased several metres away before it gave up. Interspecific aggressive behaviour was also observed. The Panoptes Blue was seen to chase a Spanish Festoon, *Zerynthia rumina* L., much larger than itself, out of its territory.

The Panoptes Blue was observed feeding several times, mainly on *Euphorbia* species within the territory (5.9% of total time observed) (Figure 1). The purpose of the aggressive behaviour may have been a defence of foodplants. No female Panoptes Blues were seen during the study, but the behaviour could have evolved in relation to courtship. When feeding the butterfly did not always adopt a basking posture orientated with respect to the sun; sometimes it did not adopt a basking posture at all. This is consistent with the results of Pivnick and McNeil (1987) who found that when thoracic

Figure 1. Proportional allocation of time by the Panoptes Blue butterfly, *Pseudophilotes panoptes*, over a four hour period.



Note: it was not always possible to distinguish between basking and resting.

temperature (and thus T_a) was high enough, adult Essex Skippers, *Thymelicus lineola* Ochsenheimer, were able to feed with their wings closed.

These observations on the behaviour of the Panoptes Blue butterfly, *Pseudophilotes panoptes* reveal thermoregulatory behaviour consistent with that proposed by Heinrich (1993) for small butterfly species. Since so little is known about the behaviour of this continental species, this may be the first documented record showing that the behaviour of the Panoptes Blue includes components characteristic of thermoregulation in many small-bodied butterflies.

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References

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An Autumnal Broad-bordered Bee Hawk, *Hemaris fuciformis* L. (Lep.: Sphingidae), in an Essex Garden

In the course of correspondence Dr R.R. Uthoff-Kaufmann recently informed me of his sighting of a Bee hawk moth in his front garden in Old Harlow, Essex, on 29th September 1994. This may, perhaps, be of interest in connection with the note by G.M. Haggitt (*antea*: 24) reporting the species in good numbers in recent years in the Norfolk/Suffolk breckland, including its appearance for about the first time in gardens and one, exceptionally, in October last. At about 10.30am in sunshine the moth arrived "from nowhere" and fed for at least a minute at flowers of variegated "busy lizzies" (*Impatiens* sp.) in a tub. The hindwings appeared to have large "eye-spots" – applicable to *H. fuciformis* only. Dr Kaufmann adds that there was at the time a local newspaper report of several other residents in the Harlow area having seen Hummingbird Hawkmoths in their gardens, and suggests with reason that some at least of these may have been Bee Hawks. A small (?) autumn brood would have been a likely product of the very hot weather of July 1994. – A.A. ALLEN, 49 Montcalm Road, Charlton, London SE7 8QG.